

## Chapter 2

# Behavioral/Cognitive Approaches to Post-traumatic Stress: A Focus on Theory

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Our goal in this chapter is to provide readers with an introduction to the clinical theory that characterizes a behavioral approach to the treatment of post-traumatic psychological sequelae. Clinicians unfamiliar with behavior therapy often view this approach inaccurately as a series of techniques to be applied atheoretically to people in distress. We will focus on the theoretical foundations of behavior therapy and behavioral conceptualizations of post-traumatic stress in order to introduce readers to the concepts that underlie behavior therapy for trauma survivors. In the course of this chapter, we hope that it will become apparent to the reader that behavioral/cognitive theories of post-traumatic stress provide a useful foundation and guide for a range of therapeutic interventions, not only those traditionally considered cognitive or behavioral. In a later chapter in this volume (Chapter 4), we will detail the specific techniques (derived from these conceptualizations) that have been found efficacious in treating the psychological sequelae of trauma. We will also illustrate how these procedures can be applied with care, empathy, and thoughtful flexibility so as to promote change in traumatized clients.

We intend these two chapters to be read together. We believe that much of the confusion over how to characterize behavior therapy has arisen because behavioral and cognitive techniques have been considered without attention to the theoretical foundations of these approaches. This separation may be partly due to behavior therapists' frequent use of manualized treatment protocols that fail to convey the complexity of behavior therapy. Such manualized treatment is beneficial in that it has allowed cognitive-behaviorists to establish empirical support for the efficacy of their treatments (support that is too often lacking in the mental health field). However, because they are devised for research purposes where standard-

ization is essential, these manuals decrease the emphasis on individualized treatment plans that are critical to behavioral formulations (Goldfried & Davison, 1994). The advent of numerous trademarked protocols for the treatment of post-traumatic stress and other anxiety disorders that incorporate elements of a cognitive-behavioral approach but posit differing mechanisms of change further contributes to the confusion regarding what constitutes cognitive-behavioral treatment of a psychological disorder. Finally, the increasing characterization of interventions as purely cognitive, particularly in the popular press, which seems to depict "CBT" solely as rational thinking, or "how to think yourself to happiness," also contributes to misconceptions of cognitive-behavioral therapy. These characterizations inaccurately represent the cognitive element of behavioral approaches, and minimize what we feel is the crucial foundation of behavioral principles in cognitive-behavioral therapy.<sup>1</sup> We hope to correct these misperceptions here by focusing on what we consider to be the fundamental elements of behavioral approach to understanding the psychological sequelae of trauma.

In this chapter, we will present a description of the principles that guide our therapy with trauma survivors. We have chosen to reverse the usual naming convention (cognitive-behavioral) in our discussion in order to emphasize the primacy of behavioral principles in our approach. Behavioral approaches rest on the assumption that behavior is lawful and that one can specify its function through identifying relevant antecedent, organismic, and consequent conditions (Goldfried & Davison, 1994). The central task of therapy based in this theory, then, is to carefully assess the circumstances surrounding any given behavior, hypothesize the function(s) of this behavior, derive and implement interventions based on this functional evaluation, continually assess the effects of these interventions, and revise one's conceptualization and intervention strategies accordingly.

In the following pages, we first review some of the central concepts in behavioral/cognitive theory and then illustrate how these principles have been used to understand the psychological sequelae of traumatic exposure. In this chapter, and in Chapter 4, we include discussion of how behavioral theory can be applied to the range of post-traumatic difficulties clients experience, rather than limiting ourselves solely to symptoms of post-traumatic stress disorder (PTSD) (American Psychiatric Association, 1994). Finally, we will briefly discuss ways in which these principles and functional assessments can help to guide treatment. This link between behavioral principles and therapy will be discussed in more detail in Chapter 4.

## CENTRAL TENETS OF BEHAVIOR THERAPY

The central tenet underlying behavioral therapy is that observed behavior is learned through the principles of classical and operant conditioning, modeling, and verbal information transfer; further, these principles may be

used to modify or replace problematic behaviors.<sup>2</sup> A specific behavior can be understood as stimulus- or contingency-driven, or both. Stimulus-controlled behavior is thought to develop through classical conditioning, or association. When previously neutral stimuli are associated with emotionally meaningful stimuli (unconditioned stimuli), they often come to elicit similar emotional responses (and thus become conditioned stimuli). For instance, a Vietnam veteran who went through a terrifying firefight on a hot, muggy, rainy day might associate these environmental factors with the fear he felt at the time, and thus repeatedly experience fear on hot and muggy or rainy days. Such associations typically occur outside of conscious awareness so that these conditioned emotional responses are often experienced as unwarranted and surprising.<sup>3</sup> Once a response has been classically conditioned to a specific stimulus, additional stimuli may come to elicit similar responses through the mechanism of stimulus generalization. Stimulus generalization refers to the fact that stimuli that are similar to the originally conditioned stimulus will come to elicit similar responses (though perhaps of a lesser magnitude). So the Vietnam veteran might also come to experience fear in the shower or the boiler room, or any other hot or wet place.

Individuals also learn through operant conditioning based on the contingent consequences of their behavior. In this case, a behavior that results in a desired outcome (or the reduction of an undesired outcome) will be repeated and a behavior that results in an undesired outcome (or the reduction of a desired outcome) will be eliminated. Thus, a rape survivor who has a glass of wine following this horrifying experience might learn (again often without conscious awareness) from the ensuing reduction in distress she experiences to repeat this behavioral response (drinking) in times of distress. When desirable consequences follow a given response (or undesirable things are taken away) we are naturally inclined to repeat that response, even if rationally we are aware of long-term negative effects. Contingencies, particularly when they are strongly negative or positive, have a powerful influence on our behavior that can be hard to counteract rationally. These two relatively simple concepts interact in a variety of ways to produce patterns of behavior.

One potentially important distinction made in behavioral conceptualizations is between historical, etiological factors and current, maintaining factors for a given behavior. When developing treatments to encourage changes in behavior, it is important to recognize that the contingencies that may have led to the development of the behavior and those that serve to maintain it at the present time may be quite different. To bring about a change in current behavior usually requires an intervention aimed at addressing the maintaining factors. Take, for instance, a male client who does not display his emotions. We might learn that when he was a child he was consistently punished for any type of emotional expression. Although these

contingencies are no longer present in adulthood, his behavior persists. This conceptualization of the historical factors for his current behavior may reduce his self-blame and help him see his behavior as a reasonable response in such conditions. However, those contingencies no longer account for this habit of emotional suppression. It becomes important to explore factors that contribute to the persistence of this behavior in adulthood. It may be that this emotional suppression is associated with a short-term decrease in distress that reinforces and perpetuates this style of responding. Further, the client may not have developed more effective means of affect regulation, so that to simply begin expressing his emotions would result in excessive emotionality and distress. These *maintaining* factors are of central importance in planning interventions aimed at this behavior.

Another layer of complexity in behavioral theory stems from evidence that individuals learn in ways other than direct experience. A series of studies has demonstrated that individuals learn through observing others (see Bandura, 1977, for a review). Observational learning appears to follow many of the same principles as direct learning. For example, studies have shown that individuals are more likely to exhibit a behavior if they have watched a model (another person) perform it and then receive a desirable consequence than if the model received an unwanted consequence (Bandura, 1965, 1977). Children who witness battering in their homes may learn that violence is a way of expressing anger, solving disagreements, or receiving subsequent affection. Individuals also learn from information that is communicated verbally by authority figures (e.g., a caregiver who says, "If you show your feelings you're not a real man!"). Once established, these verbal rules may persist even in the face of contradictory experience.<sup>4</sup> In addition to learning verbal rules, individuals learn to associate verbal material (spoken words or thoughts) with other stimuli or with consequences (i.e., through classical and operant conditioning). So words themselves can become associated with various emotions and verbal behavior is impacted by environmental contingencies. For instance, a girl might find that each time she says something self-deprecating she receives attention from her mother, and so may learn to self-deprecate more often and generalize the behavior so she thinks these thoughts even in the absence of external reinforcement.

Behaviorists agree that previous learning impacts subsequent learning. Based on learning history (including direct experience, observation, and verbal communication), individuals develop rules or expectancies regarding which stimuli are likely to co-occur and which contingencies are likely to follow particular responses. These expectancies then shape an individual's processing of information such that each person is more likely to attend to and remember information consistent with his or her expectations and ignore inconsistent information (e.g., Beck, Rush, Shaw, & Emery, 1979; McCann & Pearlman, 1990). In this way, one's current experience is

shaped by what one has experienced, witnessed, or been told in the past. Thus, an individual who has had repeated experience with physical punishment preceded by anger might develop the expectancy that anger cues are a danger signal. This individual might attend closely to subtle facial and vocal indices of anger and ignore other stimuli that suggest safety. While this adaptation would be protective in an abusive situation, its generalization to other situations would likely result in an increased experience of interpersonal sensitivity, with elevated perceptions of others' anger, coupled with inattention to other interpersonal emotions. This would in fact intensify the perception that the world is a dangerous place.

A final important component of a behavioral conceptualization is recognition of potential behavioral deficits. An individual may have simply never learned how to exhibit a desirable behavior (Goldfried & Davison, 1994) or may be unable to enact a particular behavior in certain contexts. This can be a critical distinction to make in treatment. An individual who exhibits socially phobic behavior may not derive any benefit from extensive exposure to social situations (which would be a reasonable treatment from a classical conditioning conceptualization) if he or she does not know how to engage socially and cannot spontaneously exhibit these behaviors. Some form of skills training would be an essential ingredient of treatment for such a client.

## **A BEHAVIORAL/COGNITIVE CONCEPTUALIZATION OF POST-TRAUMATIC STRESS DISORDER AND ASSOCIATED DIFFICULTIES**

Several behavioral/cognitive theories of PTSD have been proposed based on the concepts reviewed above. The reader is directed to these sources for a more comprehensive discussion of these theories (Chemtob, Roitblat, Hamada, Carlson, & Twentyman, 1988; Foa & Riggs, 1994; Foa, Steketee, & Rothbaum, 1989; Keane, Fairbank, Caddell, Zimering, & Bender, 1985; Litz & Keane, 1989). Here, we will only highlight the central elements in these conceptualizations, and touch on how behavioral principles can also be applied to those sequelae of traumatic exposure not encompassed in the diagnosis of PTSD as well.

Keane and his colleagues (1985) presented the first behaviorally based model of PTSD. This model used Mowrer's (1960) two-factor theory of fear development to account for the fear-based symptoms seen in PTSD (e.g., subjective fear, physiological arousal, avoidance). Briefly, during a trauma, individuals are classically conditioned to experience fear reactions to stimuli that were previously seen as neutral or positive (e.g., the combat veteran described earlier who comes to fear muggy, hot days). Keane and his colleagues also suggest that the intensity of the original conditioning experience (the trauma) leads to a broad generalization curve. That is,

many stimuli that are similar to those that were originally associated with fear also come to elicit fearful responses. This principle of stimulus generalization helps account for the range of cues that evoke conditioned emotional responses among trauma survivors. For instance, strong reactions to the sound of gunfire might generalize to extreme reactions to a range of loud, unexpected noises. Higher order conditioning further contributes to the breadth of cues that elicit emotional responses. According to this behavioral principle, once a stimulus has been associated with a particular response (e.g., fear), it can function as an unconditioned stimulus to classically condition the response to other stimuli. For instance, a car backfiring, which serves as a conditioned stimulus in the example above, might occur in a given neighborhood, prompting a trauma survivor to become fearful of the neighborhood itself, or other sights, sounds, or smells that co-occur with the car backfiring.

Through classical conditioning and stimulus generalization, the trauma survivor may come to fear a wide range of situations and cues. The second component of Mowrer's theory focuses on the natural tendency to develop behaviors that avoid this conditioned fearful arousal. Behaviors that are successful at reducing fearful arousal are reinforced by the reduction in distress experienced by the individual (negative reinforcement). Thus, through the mechanisms of operant conditioning, the behaviors become more likely to reoccur in the future, leading to the extreme avoidance sometimes demonstrated by persons with PTSD. For instance, a woman who was raped in an elevator may experience extreme fear every time she approaches an elevator. If she turns and walks away from the elevator, she will experience immediate, welcome relief. This will increase the chances that she walks away from elevators in the future, or begins to avoid them altogether.

Many conditioned fears are short-lived because repeated exposure to conditioned stimuli in the absence of the unconditioned stimulus naturally leads to fear reduction. An individual may almost get hit by a moving bus, experience intense fear, and associate that fear with the bus. However, she will see many buses throughout the day that do not almost run her over, and the fear will decrease. When a previously neutral stimulus that has become associated with fear is presented repeatedly without the original fear-provoking stimulus, the fearful association diminishes (McAllister & McAllister, 1995). However, avoidance of the conditioned stimuli interferes with this process so that conditioned fear is maintained. In the example above, the woman who walks away from the elevator is not allowing herself to experience the elevator without an assault, so her fearful association with the elevator will not diminish. In fact, since she is likely to interpret her increased arousal in the presence of the elevator as confirmation of her fear, she only experiences corroboration of the danger she imagines. In this way, the avoidance associated with PTSD results in the maintenance of

fearful responding to a range of cues. The avoidance component of this theory is central to the treatment strategies advocated for the fear-based symptoms of PTSD: A basic underlying principle of behavioral treatment of PTSD involves exposure to feared stimuli in order to diminish fear responses and eliminate threatening meanings.

Information/emotional processing theories of post-trauma reactions have expanded on this basic model by adopting network models of emotion to understand how fearful associations are maintained and how they can be altered. Foa and colleagues (1989) conceptualize PTSD using Lang's (1985) bioinformational model of emotions. In this model, information regarding associations between stimuli (e.g., sights, sounds, smells), responses (heart racing, palms sweating, running away), and meaning ("I'm going to die," "This is my fault") is stored in memory networks. Activation of one or more components increases the chances of activating associated components so that an increase in heart rate (e.g., from running upstairs) might lead to thoughts of death, thoughts of death might elicit recollections of traumatic images, and so on. Similar to the original behavioral conceptualization, stimulus generalization and higher-order conditioning broaden this associative network. This spread of activation may also occur through the meaning element: Stimuli that were once associated with safety meanings are likely to be present during a traumatic event, so their meaning elements will be altered to signaling danger. By association, other safety cues will similarly come to be reconstrued as danger cues. For example, a woman raped in her home (a place typically associated with a feeling of safety) may find herself afraid in numerous situations that used to feel safe (e.g., her place of work, her friends' homes, her car) because the meaning of these situations has changed from safety to dangerousness. Thus, traumatic exposure may result in a broad associative network that is easily activated by a range of stimuli, responses, and meanings.<sup>5</sup>

Based on extensive research on the mechanisms of exposure therapy in the anxiety disorders, Foa and Kozak (1986) propose that successful processing occurs when the memory network is fully activated (stimulus, response, and meaning elements are accessed and arousal is experienced) and new information is incorporated into the network (e.g., no negative outcomes occur; the individual experiences the safety of the therapeutic relationship rather than the danger of the traumatic event). Avoidance will reduce the chances that this network is sufficiently activated for new (non-threatening) meanings to be incorporated; therapy must therefore target and reduce even subtle forms of avoidance.

Information-processing theorists have postulated that these trauma-related fear networks influence survivors' perceptions of their current experiences. Because these networks include salient danger and vulnerability meaning elements, they contribute to a tendency to experience the world as threatening. A host of empirical studies demonstrate clinically relevant

individual differences in attention to and recall of emotionally salient information (see Litz & Keane, 1989; Mathews, 1990; Williams, Mathews, & MacLeod, 1996, for reviews). A person's expectations, predictions, and beliefs about what is likely to happen in the world, or to him or herself in particular, shapes what he or she attends to, recalls, and interprets from ambiguous situations. An individual who has experienced a traumatic event may be shaped by this event to expect, predict, and perceive threat and danger, more than a non-trauma-exposed individual. These ways of perceiving (schemas) then shape the experiences of this individual so that future learning may confirm perceptions of danger and vulnerability. A therapist must recognize and take into consideration these information-processing biases during treatment.

Behavioral or cognitive/behavioral theories of PTSD have tended to focus on the fear-related aspects of the disorder. However, many of the same principles may be used to account for many other symptoms of the disorder as well as co-morbid problems that are typically not conceptualized as part of the disorder itself. For example, it is often the case that the intense emotional reactions of persons who have been traumatized extend beyond feelings of fear to include other negatively valenced emotions such as anger, shame, guilt, and sadness. Behavioral models of PTSD account for these reactions in much the same way as conditioned fear reactions. That is, the principles of classical conditioning can work to associate stimuli present at the time of the trauma with any emotions experienced at that time. The processes of stimulus generalization and higher-order conditioning will operate to lead these emotional overreactions to occur in response to a wide range of environmental stimuli. As with fear, individuals also may engage in a variety of behaviors that serve to avoid the distress associated with these other emotional responses, but interfere with long-term successful processing of these reactions that would reduce their intensity (Rachman, 1980). For instance, a trauma survivor might experience anger in response to many trauma-related cues, but suppress these feelings and avoid these cues so that the anger is never sufficiently experienced, understood, and diminished.

Paradoxically, in addition to these kinds of excessive emotional responses, trauma survivors also experience deficits in emotional responding in certain situations. These emotional deficits, termed "emotional numbing," have historically been less well understood in the traumatic stress literature (see Litz, 1992, for a review). In general, behaviorally oriented theorists have conceptualized these deficits as an avoidance strategy aimed at reducing distress resulting from the cued emotional reactions that form the core of PTSD (Keane et al., 1985). However, many additional hypotheses have been proposed: Emotional numbing may be biologically mediated (van der Kolk, 1996); it may be comparable to freezing behavior observed among animals exposed to uncontrollable aversive stimulation (Foa, Zin-



barg, & Rothbaum, 1992); it may be a by-product of diminished attentional resources due to hyper-responsivity to threat cues (Litz, 1992); it may be a result of intentional suppression of emotional responses (Litz, 1992); and/or it may stem from skills deficits in emotional awareness and regulation<sup>6</sup> (Linehan, 1993). In all likelihood, these deficits are multiply determined, and the experience of emotional numbing is varied across individuals. While some survivors may experience emotions but choose not to express them, others may experience undifferentiated arousal but be unable to label and process it, whereas still others may not experience any arousal at all when they feel "numb." For any given client, it is important to assess these distinctions, as each possibility would have different implications for treatment.

Other problems associated with PTSD have been conceptualized as avoidance-motivated behaviors. For example, alcohol and drug use are thought to reduce the occurrence of intrusive thoughts and nightmares and to limit the emotional distress associated with these symptoms when they do occur. As with other avoidance behaviors, if the use of alcohol or drugs proves useful in reducing distress, the behavior will be enacted more frequently. In some cases this will lead to diagnosable substance-use disorders concurrent with the PTSD (see Ruzek, Polusny, & Abueg, 1998, for a more in-depth discussion of co-morbid substance abuse). A similar conceptualization has been proposed to explain dissociative behavior among trauma survivors (Wagner & Linehan, 1998). This model suggests that individuals may develop a habit of dissociating that is negatively reinforced by the reduced distress that accompanies it, leading to increased frequency of dissociation.

In behavioral models of trauma reactions, careful assessment is advocated in order to determine the exact nature of the relationship between co-morbid disorders and PTSD. Often, disorders emerge as a direct result of trauma-related symptomatology. For instance, individuals who have suffered with PTSD for some time may find themselves feeling hopeless and helpless as a result of the seemingly uncontrollable, persistent distress they experience. These feelings can be compounded by the trauma-related tendency to view the world as dangerous and themselves as vulnerable. Hopelessness may be further heightened by the environmental consequences of post-traumatic symptomatology: Often, symptoms result in lost jobs and ended or strained relationships. These stressful life events, coupled with feelings of hopelessness and helplessness, set the stage for depression, which is so often co-morbid with PTSD. On the other hand, recent data suggest that depression may, in some cases, represent an alternative to PTSD as a response to trauma (Shalev et al., 1998). It may be that individuals who experience trauma primarily as a loss, with its associated sadness, develop depression, while those individuals who experience the trauma as a threat with a great deal of fear would be more likely to develop PTSD. The prev-

alent emotion experienced at the time of, or directly following, the event is likely to become more pervasive due to higher-order conditioning and stimulus generalization, and therefore might become characteristic of a subsequent disorder if one emerges.

Co-morbid anxiety disorders may also emerge as a result of PTSD symptomatology. Progressively increasing avoidance of a range of stimuli, along with a newly developed belief that the world is dangerous, may result in such marked avoidance of a range of situations that a co-morbid diagnosis of agoraphobia is warranted. Similarly, traumatic exposure is often followed by a host of negative social experiences (e.g., homecoming for Vietnam veterans, victim-blaming following disclosure of sexual assault) that may set the stage for the development of social phobia, as social cues become conditioned stimuli to be avoided (Orsillo, 1997). Alternatively, the heightened conditioned emotional responses among trauma survivors may take the form of full-blown panic attacks. This panic can come to serve as a conditioned stimulus itself, so that the experience of panic triggers traumatic associations, which heighten fear and exacerbate panic reactions (Resnick, 1997). In each of these cases, the functional association between various symptoms will help determine the appropriate sequencing of targets for intervention as well as when to consider concurrent treatments. For example, panic attacks may interfere with trauma-focused treatment because the experience of trauma-related distress may be a cue for a panic attack, resulting in avoidance of the emotional engagement needed for trauma-focused treatment. Thus, in some cases, treating the panic first, perhaps through interoceptive exposure, may be necessary (Falsetti, 1997). In other cases, however, such physical sensations might be overwhelmingly strong trauma cues, so that treatment of panic might need to take place after exposure treatment focused on the trauma itself, in order to reduce the strength of those associations.

Other difficulties that often present among individuals with PTSD have been conceptualized within the behavioral framework as skill deficits. For example, individuals with PTSD often experience difficulties in interaction with others. These problems have typically been seen as reflecting an inability to utilize appropriate social skills. It is not clear, however, whether this deficit represents a general deficit in the learning of skills (which may be particularly likely among those raised in a traumatic or invalidating environment), the loss (or disuse) of skills that were learned previously, or the inability to use skills when confronted with situations that are associated with emotional arousal similar to the trauma. As noted above, emotional dysregulation may also be due, in part, to deficits in the ability to identify, communicate, and regulate emotional reactions. It seems likely that within the large number of individuals with PTSD, individual cases of apparent skill deficits reflect any or all of these models.

As is apparent from the discussion above, trauma-related psychological

difficulties are likely to be multiply determined. Specific factors (such as social skills or emotional deficits) may serve as both risk factors for the development of PTSD and consequences of the disorder. Clinicians should conduct a careful assessment of PTSD symptoms as well as of the associated features, and develop a conceptualization that considers these various functional relationships.

We have presented a brief overview of behavioral/cognitive theories as they can be applied to understanding trauma-related psychological difficulties. This overview provides a framework in which to conceptualize the diverse clinical presentations that characterize trauma survivors. In Chapter 4, we outline the key elements of therapy that emerge from this conceptual basis and have received empirical support.

## NOTES

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1. Empirical studies support our view that behavioral elements are an essential, active ingredient in cognitive-behavioral treatments (e.g., Feske & Chambless, 1995; Jacobson et al., 1996).

2. This is not to negate biological or genetic influences on behavior; behaviorists acknowledge temperamental factors and include them as one component of the organismic variables they consider in case conceptualization. However, the therapy described here focuses on environmental factors as targets for intervention.

3. See Rescorla (1988) for a discussion of possible mechanisms underlying classical (Pavlovian) conditioning, which are beyond the scope of this discussion.

4. Hayes (1994) has argued that this persistence accounts for a majority of psychological difficulties, because rules interfere with new learning that would otherwise maximize adaptive behavior.

5. Foa and Riggs (1994) provide some suggestions for how to predict who will develop such elaborated fear structures and who will not, suggesting that individuals with rigid preexisting schemas regarding safety, self-worth, and meaning in the world will be most at risk for marked alterations in their associative networks/schemas.

6. Skills deficits may be particularly likely among those individuals who were raised in "invalidating" environments in which their emotional experiences were not acknowledged or were punished.

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